



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

GEOGRAPHIC VARIATION IN *BASSARISCUS ASTUTUS*, WITH  
DESCRIPTION OF A NEW SUBSPECIES.

By SAMUEL N. RHOADS.

The recent accession of three specimens of *Bassariscus*<sup>1</sup> to the museum of the Wagner Free Institute of Science in Philadelphia makes four individuals of the genus known to have been taken in the State of Oregon.

The first record was made by Dr. Coues in the *American Naturalist* in 1878. This specimen was taken in southwest Oregon on the Rogue River; the rest were captured by Mr. Geo. Kenzer near Grant's Pass in Josephine County, a few years ago. They were mounted by him, and, since arriving in Philadelphia, two of them have been remounted and their skulls removed for examination.

Antedating these, the most northern records, we have the statement of George Gibbs, Esq., in the *Natural History of Washington Territory*, that in 1852 he "found their skins quite common on the Lower Klamath River" but we have no positive evidence that any of the skins were taken on that part of the Klamath River lying north of California.

The dark colors of the Rogue River specimen are commented on by Dr. J. A. Allen in his paper "On the Species of the Genus *Bassariscus*"<sup>2</sup> as follows: "The extremes of variation in color are in specimens No. 11,849 from Camp Grant, Arizona (E. Palmer) and No. 12,849, from Oregon (A. H. Wood). The Arizona specimen is pale brownish gray above, varied with blackish principally along the median line, caused by the black tips of the long hair. Below, it is pale yellowish white. The tail is mostly white below but above is crossed by alternate rings of black and white of nearly equal breadth. The Oregon specimen has the prevailing tint of the dorsal region intense black, quite obscuring the brownish gray ground color. Below, it is strongly brownish yellow, deepest on the throat and chin.

<sup>1</sup> *Bassariscus* of Lichtenstein, 1827 (1830) preoccupied by *Bassariscus*, Hubner 1816. See *Science*, Vol. 9, 1887, P. 516.

<sup>2</sup> Art. XVIII Bull. U. S. Geol. Sur. Terr., 1879.

The tail is mostly black above, the white being mostly half-rings confined to the lower surface. These two specimens accord with the peculiar phases of geographical color-variation commonly characterizing the mammals and birds of the two regions in question. Should the Oregon specimen here described prove to indicate the average condition of the species along the Pacific coast to the northward, as seems probable, the form there prevailing may require to be varietally distinguished under the name *raptor* Baird, this name doubtless referring to the Pacific coast form as already explained. Five specimens from near the southern border of Texas agree in being rather darker than the Arizona specimen and present only a moderate range of color variation."

The three additional specimens from Grant's Pass sufficiently confirm the color characters alluded to by Dr. Allen to make the question of subspecific separation worth careful consideration. With this in view I have, through the courtesy of Mr. F. W. True, secured the loan of the Smithsonian Institution series of *Bassariscus astutus*. The series consists of eighteen specimens; of these the majority are hunters, or flat skins, lacking skulls. Skulls accompany eight, measurements and data, five, and the whole series is labeled with the locality of capture.

Beside these and the Oregon specimens, I have examined four in the museum of the Academy of Natural Sciences, making a total of twenty-five. Among them is the type, skin and skull, of Baird's '*B. raptor*.' A most valuable and important addition to the series consists in a set of five (2 ♂ s, 2 ♀ s and 1 juv. ♂) finely prepared skins and skulls from Cuernavaca, Morelos, Mexico, taken in 1892, by Mr. P. L. Jouy.

Apart from their excellent preservation and full data these specimens are unique in being the only ones in the series taken in the southernmost range of *B. astutus*, where it overlaps the habitat of *B. sumichrasti*.

We must first determine from what locality came the type specimens of *astutus*. Lichtenstein states in his description that these were sent to the Berlin Museum by one Dr. Deppe during the residence of the latter in Mexico. We are left to our imagination as to the precise locality of Dr. Deppe's residence, and, while it is reasonable to believe that the type specimens were taken in the "vicinity" and that it is very probable the doctor "practised"

south of the twentieth parallel in those early days, direct evidence is wanting.

But we have in Lichtenstein's conscientious description and plate of *astutus* in *Darstellungen der Säugethiere der zoologische Museum*, (1827-34, pl. 43) so exact a reproduction of the peculiarities of the Cuernavaca specimens taken by Mr. Jouy as to leave us in no reasonable doubt that the type of *astutus* came from southern Mexico. Lichtenstein's description makes no allusion to variations from the type in the numerous examples at his disposal. If, however, we compare therewith specimens from northern Mexico northward we find an increasing departure from the characters assigned to typical *astutus* until, in the Oregon examples, we have a form to all appearances quite distinct.

It is quite proper that the two should be separated, perhaps specifically, though there is some probability that a complete series will insensibly connect the two extremes. Such cranial differences as I have detected may all come within the range of individual and geographic variation. At any rate the skull series is too incomplete as yet for a decided answer.

In either case the question arises as to the tenability of the name '*raptor*' for the northern form. It was originally proposed for a Pacific Coast species.

The value of the name is, in the first place, lessened by the fact that it was applied to an animal escaped from confinement in the east and "supposed" to come from California.

The distinctive characters assigned to '*raptor*' by Baird are: *a*, small number of black rings on tail and of greater extent compared with white rings; *b*, black rings nearly complete below; *c*, no difference in colors of remaining parts of body; *d*, ears decidedly smaller; *e*, cranium broader, more constricted behind post-orbital processes; *f*, temporal crests closer together; *g*, pterygoids farther apart; *h*, ratio of greatest breadth to length 63 to 100 instead of 59, as in a female from Texas. Dr. Allen has shown, and the series in my possession verifies his view, that these cranial differences are accountable to age, sex and individual variation. The skull of *raptor* is nearly duplicated by No. 35,254 from Texas. I find that in only one respect, the relative width of white and black tail-rings does Baird's diagnosis as given above apply to the Pacific coast form as contrasted with those from Texas. But even in this particular

typical *B. astutus* is very variable. I therefore propose, for the Bassarisk of Northern Mexico and the United States the name *Bassariscus astutus flavus*. Should the so-called *astutus* of the United States and northern Mexico prove a distinct species, the small, dark coast form from northern California northward (not of central and southern California) should be made a sub-species of *flavus*. In that case it should be called *Bassariscus flavus oregonus*.<sup>3</sup> It is possible that Dr. Merriam has enough material in his custody to decide the question at an early date.

So far as they may now be distinguished, the Civet Cats belonging to the *astutus* group are characterized :

1. *Bassariscus astutus* (Licht.)

Description.—Size large, fur scant and harsh. Tail vertebrae longer than head and body, 14 to 16-ringed exclusive of tip, black rings below interrupted by a broad, continuous mesial band.

Upper parts of body uniform blackish gray, often tinged with pale fulvous on sides of rump and belly, the black hairs of the dorsal region disappearing laterally. Under parts clear gray with dirty, pale yellowish suffusion. Underfur and roots of hairs ashy. A roundish spot above the eye, a larger one beneath it and a semilunar spot at the entrance of ear, white. Top of head, forehead, band around nose and soles of hind feet, blackish. Skull large, strong and angular; zygomatic fossae wide and deep; post-orbital processes small and deflected downwards; rostrum broad, canines widely separated; sagittal crest well developed in adult males, frontal bones narrowed and long-waisted behind the supraorbital processes; canines sulcate on the inner-posterior and anterior edges above, on the anterior edge below.

Measurements.—Total length, (Jouy.) 802 to 855, (Licht.) 850; tail (Jouy) 360 to 420, (Licht.) 368; hind foot, (Jouy) 76 to 79 (Licht.) 72; length of ear (Jouy) 45 to 49, (Licht.) 34(?); breadth of ear, (Jouy) 52 to 59, (Licht.) 25(?).

Skull.—Total length, 82 to 87; greatest breadth 53.5 to 59. Interorbital constriction 17 from tip to tip of postorbital processes 27. Taken from adult male skull.

The above is about equivalent to a translation of Lichtenstein's two original descriptions of *astutus*. The cranial diagnosis is chiefly

---

<sup>3</sup> The type will be No. 1,614, Col. Academy of Natural Sciences of Phila.

based on the four adult skulls of the Cuernavaca specimens. The variability in the width of the pterygoids is striking, the two female skulls showing the greatest width in this respect. In one of them it is nearly as great as in the skull of "*raptor*." The same variability is seen in *flavus*, but in two instances the widely separated pterygoids are present in male skulls, showing the peculiarity has no sexual significance. In two of the Cuernavaca specimens the upper terminal fourth (127 to 150 mm.) of the tail is wholly black, the remainder about equally white-and-black-ringed above. In this variation there is an approach to *sumichrasti* but the color of the under side of the tail in *astutus* is in quite the opposite direction, being as broadly white as in any examples of *flavus*.

In general terms *astutus* may be distinguished from *flavus* by its greater size, light gray colors of uniform distribution, the total lack or slight trace of fulvous admixture, paleness of the fur at base and the scantiness and harshness of the pelage.

2. *Bassariscus astutus flavus*, subsp. nov. (Type No. 972 Col. Academy of Natural Sciences of Phila.; Texas, 1861, col. by Dr. Heermann).

Description.—Size smaller; fur long, full and soft. Tail vertebrae somewhat shorter than head and body, tail 14 to 16 ringed exclusive of black tip, the black rings often nearly encircling it, (in the Oregon series the three terminal black rings completely encircle tail). Upper part of body blackish tawny, blackest medially, yellowest laterally. Top of head and neck like middle of back. Under parts tawny, lightest on throat and neck, underfur and roots of body hairs everywhere sooty. Spots above and below eyes and at entrance of ear, tawny, the blackish markings of face indistinct or obsolete.

Skull smaller, rounded, the zygomæ relatively narrower posteriorly, postorbital processes relatively wider apart, closely approached posteriorly by the forward development of the brain case the temporal bone widening suddenly at or near this point and rarely showing the waist-like configuration of *astutus*, rostrum short and tapering, the canines lying well within its contour as viewed from above, sagittal crest absent, canines less sulcate, groove disappearing in Oregon specimens.

Measurements.—Total length, 680 to 800; tail, 304 to 380; hind foot, 55 to 60; size of ears undeterminable.

Skull.—Total length, 80, greatest breadth, 50; interorbital constriction, 20; tip to tip of postorbital processes, 30.

The range in the variation of external characters among the Bassarisks from northern Mexico and the United States, excluding the Oregon specimens, is not great, but variation in the size and proportions of the skull in animals of the same age and sex from a stated locality (Texas) is perplexing, seeming to connect *flavus* with typical *astutus*.

Color characters and body measurements on the other hand are constant enough to establish their title to separate specific rank.

Some cranial points seem to confirm this view, the molar dentition of the two forms, however, is identical. A bona-fide Californian specimen is as light-colored or lighter than Baird's pseudonymous one, the latter (whose sole claim on our notice consists in its bare name) sharing the same characteristic tawny seen in darkest Texan examples. The light hued Camp Grant specimen, mentioned (*supra cit.*) by Dr. Allen is in all respects only a small, pale *flavus*.

The Oregon series on the other hand are almost as different, externally, from average Texas skins as the latter are from true *astutus*. The diminutive size, brownish black color, nearly black upper tail, completeness of the terminal black rings mesially, etc. are subspecific characters apparently separating *oregonus* from its nearest congeners in the United States.